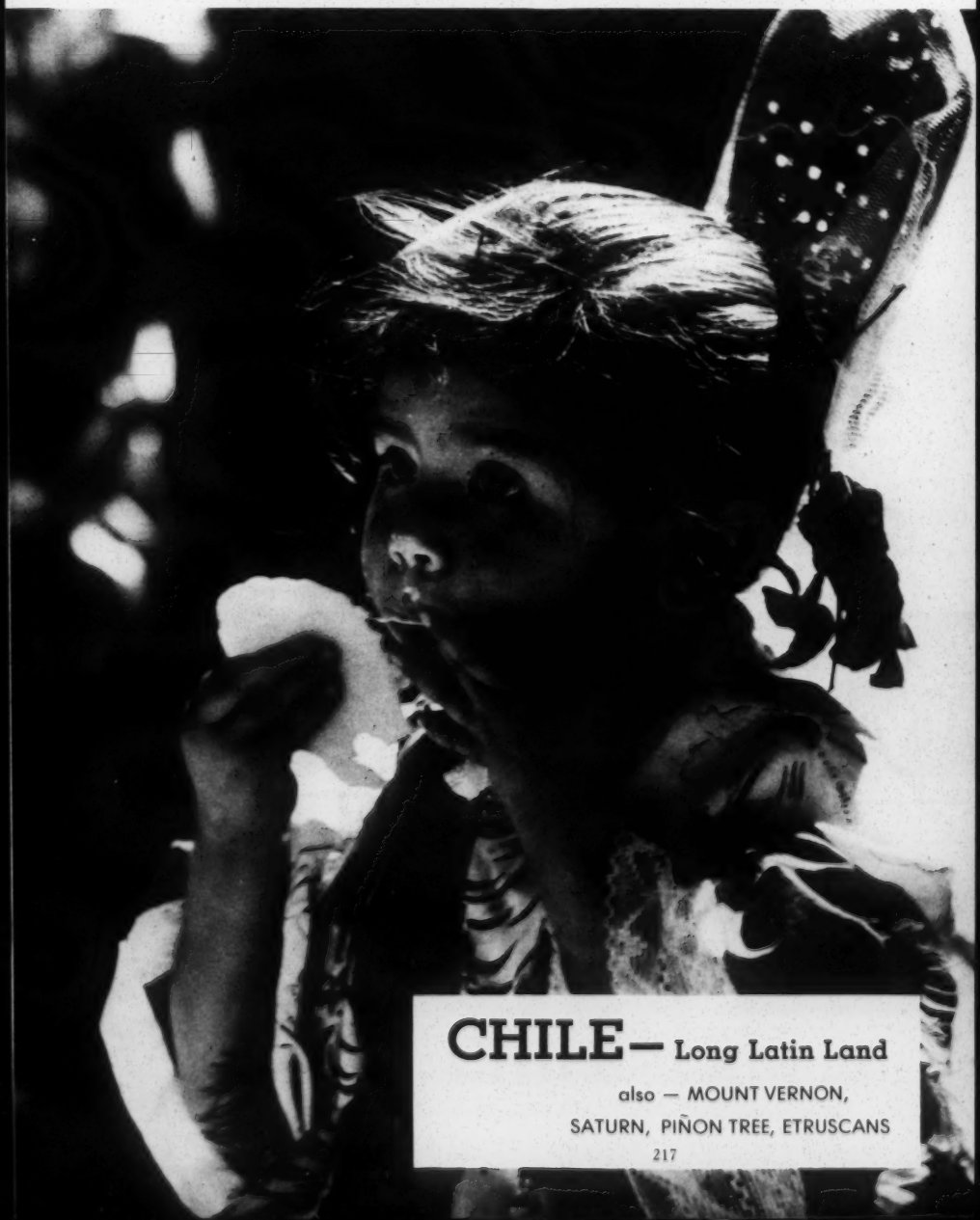
GEOGRAPHIC SCHOOL BULLETINS

THE NATIONAL GEOGRAPHIC SOCIETY, WASHINGTON 6, D.C.

FEBRUARY 22, 1960, VOLUME 38, NUMBER 19 . . . *To Know This World, Its Life*



CHILE— Long Latin Land

also — MOUNT VERNON, SATURN, PIÑON TREE, ETRUSCANS

UMI

along the country's eastern border, covering about one-third of the nation and cutting it off from neighboring Argentina and Bolivia.

About one-sixth of Chile is made up of islands that scatter along the mainland coast and include Easter Island, 2,300 miles out in the Pacific. Four hundred and fifteen miles west of Valparaíso lie the Juan Fernández Islands. Fine lobster-sized crayfish are shipped out, but fishing fame has been overshadowed by the reputation they received as the home, for four years, of Alexander Selkirk, better known as Robinson Crusoe.

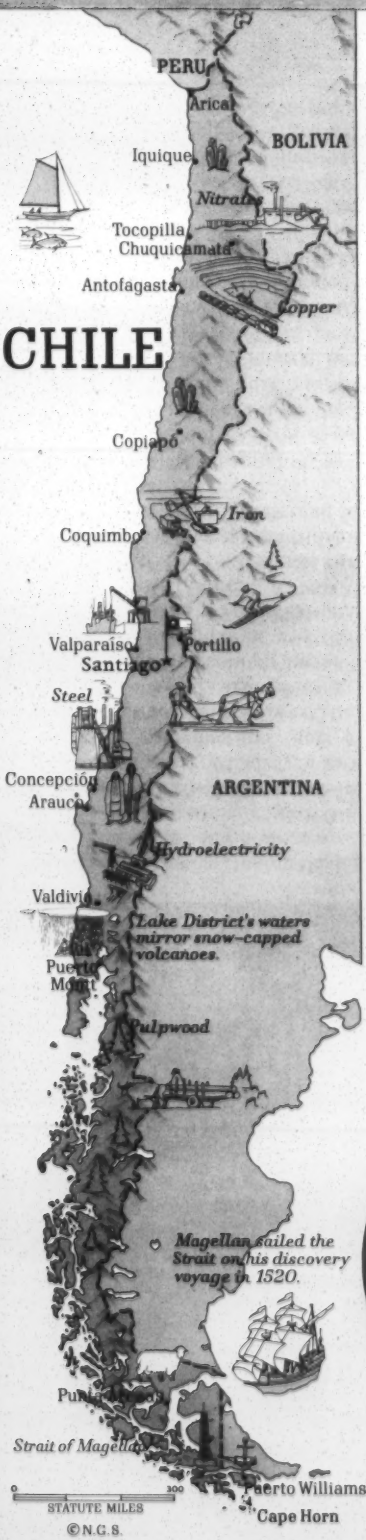
At least half of Chile is useless for agriculture. It's too rugged, too dry, too heavily forested, or too wet and cold.

The Valle Central, stretching from north of Santiago to Puerto Montt, is the core area, the section the first white settlers colonized and from which they spread out over the country.

For eons eroded earth from the mountains filled the valley so that topsoil now is 300 feet deep in places. Orchards bloom with oranges, peaches, plums, and cherries. Mountain snows water fields of wheat, corn, rice, barley, and melons. In league with the cool Peru Current off the west coast, the mountains create a climate much like that of California, and sun-drenched vineyards flourish, producing white wines that rank among the world's finest. Sunflower seeds yield oil for cooking. Eucalyptus trees flank pastures.

Blackberry vines do so well in the fruitful soil that farmers weary of chopping them down to size. However, since a Chilean chemist has recently been experimenting with the pulverized vines as cattle feed, they may become an asset.

Tractors, trucks, and threshing machines ap-



CHILE EDGES the western coast of South America between Peru and Cape Horn. It is hemmed between the Andes and the Pacific. Proud of their nation's vitality and progress despite geographic handicaps, Chileans say it's a wonderful country for the shape it's in.

I.E. Alleman and G.H. Emerson

UMI

KIP ROSS; COVER, K. CAMILLE DEN DOOVEN, JR.

'The Yankees of South America'

Photographs by Kip Ross, National Geographic Staff

WHEN PRESIDENT EISENHOWER wings over the Andes to Santiago, Chile, next week, he will view from the plane's windows one of the most varied countries on the face of the earth.

The area of Chile totals more than Nevada, Utah, and Idaho combined—286,000 square miles. On the map it resembles a string bean, averaging only 110 miles wide—little more than the distance between Seattle and the Pacific Ocean. But it is 2,650 miles long—more than the mileage from Seattle to Washington, D. C. Transferred to North America, Chile would stretch from the latitude of Ketchikan, Alaska, almost to Acapulco, Mexico.

In no other country, within such narrow limits, are such extremes of scenery and weather experienced. Wasteland deader than the Sahara, yet rich in minerals, nudges Peru on Chile's northern border. In the south, the oil fields of chill Tierra del Fuego stand at the gateway to Antarctica, 625 miles away.

Between lie lush acres of deep, rich topsoil. Fiord and glacier country recalls Norway's rugged coast. Lake and mountain scenery looks as alpine as a Swiss travel poster, but has the added attraction of smoking volcanoes.

In the Lake District shepherds (above) saddle up for a day's work among their woolly charges. Sombreroed *huasos* work cattle ranches and compete in the rodeo ring at Osorno. Araucanian Indians bring their chickens to the Temuco market. Flocks roam isolated ranches in Patagonia where Chileans are expanding sheep pastures.

Chile has the world's southernmost town, Puerto Williams on the island of Navarino. Its 300 inhabitants serve a naval base. They are ringed by a wall of mountains white-capped the year round.

The Andes, highest mountains in the world after the Himalayas, rise majestically

GEOGRAPHIC SCHOOL BULLETINS Copyright © 1960 by the National Geographic Society, Melville Bell Grosvenor, President. Published each week during school months by the School Service Division, Ralph Gray, Chief. Assistants: Arthur P. Miller, Jr., Frank Sartwell, Katherine Crapster, Liva Baker. Entered as second class matter, Washington, D.C. International copyright. All rights reserved. Rates: United States, $2.00 for 30 issues (one school year); Canada, $2.25; elsewhere, $2.50. U. S. only, 3 years (90 issues), $5.00. The National Geographic Society is a nonprofit educational and scientific society established for the increase and diffusion of geographic knowledge.

na, costumed celebrants pay annual homage to the Virgin Mary. The girl on the cover munches an orange between dances. Not far west lies Chuquicamata, the richest open-pit copper mine in the world. Two miles long and a half mile wide, it nestles 9,500 feet high in the Andean foothills.

Fifty miles southeast of Santiago rises El Teniente (the lieutenant), a mountain of ore 8,000 feet high. It is the world's largest underground copper mine.

Far to the south lies Tierra del Fuego —Land of Fire. Magellan christened the island for the many Indian fires he saw along its coast.

New fires burn there now: jets protrude from the chill and damp land, sending up blazes of excess gases from Chile's rich oil fields. Tapped 15 years ago, wells of high-quality oil produce about 2,000 barrels a day. By the light of these flaming jets, builders of oil-field boom towns work by night to bring civilization to Chile's "Wild South." L.B.

STUDENTS at the University of Concepción, above, relax between classes. Chile's literacy rate, about 80 percent, is one of the highest in Latin America. Mountain-scaling sewell, below, houses the miners who work El Teniente and help make Chile the second biggest producer of copper in the world (the United States is first).

UMI

pear on haciendas, taking the place of the age-old oxcart and flail.

Two-thirds of Chile's 7,500,000 people live in this valley. The green trough also holds the heart of Chile's industry. Concepción manufactures fine glassware. Six miles to the northwest, the government-controlled steel plant at Huachipato turns out enough metal to supply Chile's needs and to export to half a dozen other countries as well. Pig iron is shipped to the United States.

Much of the coal to feed the Huachipato plant is mined from tunnels slanting down steeply and stretching for several miles under the ocean.

Santiago, the capital, with 1,600,000 residents, nestles in sight of snowy Andean peaks (above). It has broad boulevards, lofty office buildings, and balconied apartments. Its modern tempo belies its Spanish origins—it was once the headquarters for Pedro de Valdivia, the Spanish conquistador who founded Santiago in 1541 and imposed Spanish rule on the nation.

"No romantic guitar-playing caballeros lounge about the streets. No languid-eyed señoritas wait behind barred windows for serenades," writes Kip Ross in "Chile, the Long and Narrow Land" in the February, 1960, *National Geographic*. A central intersection reminds the author of a busy corner in downtown Chicago, as young women in tailored suits click along in spike heels to office or shop.

Even the language, although officially Spanish, is not the same Spanish heard in Spain or even in neighboring Peru. It is contracted and condensed, a sign of the brisk pace at which Chileans move, earning for them the name "Yankees of South America."

In most places outside the Valle Central living is not so easy, but the land is rich in its own way. Chileans must dig deep for the bounty—a wealth of minerals.

The Atacama Desert, along the Peruvian border, sees rain perhaps once in 20 years. Yellow dust-devils swirl over barren, forbidding wastes. But from this seemingly sterile expanse, Chile extracts nitrates for fertilizers and explosives. The nation made its fortune from nitrates before World War. I. Synthetics developed during that war took away its markets. Today industrialists turn to such by-products as iodine.

Strike northeast from Antofagasta, the port for these minerals, and you come upon widely different scenes. In Aiqui-

T VERNON *Where George Washington Longed To Be*

B. ANTHONY STEWART AND JOHN E. FLETCHER, N.G.S. STAFF

NATIONAL GEOGRAPHIC PHOTOGRAPHER KATHLEEN REVIS

FOR FORMAL ENTERTAINING Washington used the handsomely appointed banquet hall at left. With family and friends, he preferred to dine, in summer, on the wide porch facing the river (right). Washington always referred to this side of the house, with its sweeping view of the Potomac, as the "back."

like Mount Vernon was a city in miniature. It had its own bakery and cobbler; its own smokehouse and farms; its own dairy, and its own looms and tailors. Spreading from the great house in the aerial view can be seen a fan of outbuildings, each a workshop or living quarters.

In 1776 Washington, harassed by the British and the dwindling of his own forces, found time to write from Harlem Heights to his manager: *I would have the whole executed in a masterly manner.*

A friend in England shipped over the elaborate mantelpiece (left). Washington wrote him that it was *Too elegant and costly by far, I fear, for my own room and republican style of living.* A Gilbert Stuart portrait of the first President hangs above it.

Upstairs, the mansion is more homelike, with four-poster beds, the General's campaign chests, and similar articles of daily use.

Whenever war or office kept him from Mount Vernon, Washington tried to visit it often. While he was President, he made the journey from the Capital fifteen times.

The year after he took office he wrote: *I can truly say I had rather be at Mount Vernon with a friend or two about me, than to be attended at the seat of government by the officers of state and the representatives of every power in Europe.* F.S.

UMI

JOHN E. FLETCHER, NATIONAL GEOGRAPHIC STAFF

MOUNT V

Everyone knows the beginning of the quotation:

First in war, first in peace, and first in the hearts of his countrymen...

But few remember the second half:

...He was second to none in the humble and endearing scenes of private life.

In George Washington's case, private life took place at Mount Vernon, his wide estate on the Virginia shore of the Potomac River. Whenever the new nation that proudly called him "the father of his country" would let him, he came home. He wanted most to live the quiet life of a planter, overseeing his crops and herds, entertaining friends.

George Washington is buried in a simple tomb on the ground he loved. But his living presence can be felt as well. More than a million persons visit his home each year, seeking a glimpse of the man and the life he led. Few are disappointed.

In the 18th century an estate

IT VERNON *Where George Washington Longed To Be*

B. ANTHONY STEWART AND JOHN E. FLETCHER, N.G.S. STAFF

NATIONAL GEOGRAPHIC PHOTOGRAPHER KATHLEEN REVIS

FOR FORMAL ENTERTAINING Washington used the handsomely appointed banquet hall at left. With family and friends, he preferred to dine, in summer, on the wide porch facing the river (right). Washington always referred to this side of the house, with its sweeping view of the Potomac, as the "back."

like Mount Vernon was a city in miniature. It had its own bakery and cobbler; its own smokehouse and farms; its own dairy, and its own looms and tailors. Spreading from the great house in the aerial view can be seen a fan of outbuildings, each a workshop or living quarters.

In 1776 Washington, harassed by the British and the dwindling of his own forces, found time to write from Harlem Heights to his manager: *I would have the whole executed in a masterly manner.*

A friend in England shipped over the elaborate mantelpiece (left). Washington wrote him that it was *Too elegant and costly by far, I fear, for my own room and republican style of living.* A Gilbert Stuart portrait of the first President hangs above it.

Upstairs, the mansion is more homelike, with four-poster beds, the General's campaign chests, and similar articles of daily use.

Whenever war or office kept him from Mount Vernon; Washington tried to visit it often. While he was President, he made the journey from the Capital fifteen times.

The year after he took office he wrote: *I can truly say I had rather be at Mount Vernon with a friend or two about me, than to be attended at the seat of government by the officers of state and the representatives of every power in Europe.* F.S.

UMI

JOHN E. FLETCHER, NATIONAL GEOGRAPHIC STAFF

MOUNT V

Everyone knows the beginning of the quotation:

First in war, first in peace, and first in the hearts of his countrymen. . .

But few remember the second half:

. . . He was second to none in the humble and endearing scenes of private life.

In George Washington's case, private life took place at Mount Vernon, his wide estate on the Virginia shore of the Potomac River. Whenever the new nation that proudly called him "the father of his country" would let him, he came home. He wanted most to live the quiet life of a planter, overseeing his crops and herds, entertaining friends.

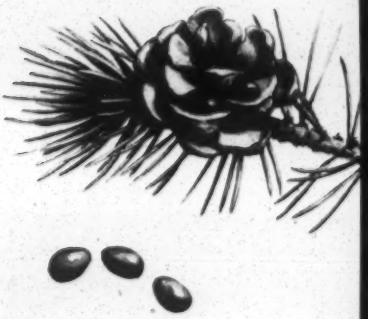
George Washington is buried in a simple tomb on the ground he loved. But his living presence can be felt as well. More than a million persons visit his home each year, seeking a glimpse of the man and the life he led. Few are disappointed.

In the 18th century an estate

thinnest things in the solar system—since methane atmosphere is poisonous. F.S.

224

Drought-Resistant Pine of the Plateaus: PIÑON



IN THE DRY Southwest, wherever there's enough water to moisten your hatband, a piñon grows.

These gnarled and stunted pines require less than 12 inches of rainfall a year. Where much less than that falls there are no trees—only sagebrush, cactus, creosote bush. Where there is more water huge columnar ponderosa pines take over.

In this region of yellow sands, red earth, silver-tipped mountains, and turquoise skies, precipitation depends on elevation. Those who know the up-and-down land of canyon, mesa, and plateau can tell you the height above sea level by a glance at the vegetation; the higher they are the more there is.

The piñon *(Pinus edulis)* occupies the middle rungs of this stepladder geography. Its favorite home is in the 6,000-to-8,000-foot range along canyon or arroyo bottoms (below) or on broad plateau shelves. It occurs in greatest numbers in New Mexico (where it is the State tree), Arizona, Utah, Colorado, and southeastern California. It may live 375 years.

PAINTINGS BY NATIONAL GEOGRAPHIC ARTIST WALTER A. WEBER

Twisted logs and beams cut from piñon seemingly never rot. Some of them, used as *vegas*, or roof beams, by pre-Columbian Indians, remain in such good condition that their annual growth rings are easily counted. Pueblo Bonito and many other ruins were thus dated by National Geographic scientists.

Piñon nuts (above) saved the life of the first white man—the lost Spaniard Cabeza de Vaca—to travel the area. In the 1530's, he and his starving companions stumbled into piñon country as the seeds ripened.

The nuts need two years to mature, and yield is spotty; 1959 was a bumper year. Indians and Mexican-Americans climbed the sun-baked slopes, feasted to their heart's content, and shipped more than a million tons east for use in candy-making. R.G.

225

UMI

Solar System No. 7

SATURN

MT. WILSON AND PALOMAR OBSERVATORIES

GIRDLED by its distinctive rings, Saturn is the gem of the heavens, more beautiful in the telescope than any other planet. And, like some sights on Earth, it is more attractive from afar.

In size, Saturn is second to Jupiter with an equatorial diameter of 74,000 miles. It is so far from the sun (886 million miles) that it is eternally cold, with temperatures of -238° F.

Like Jupiter, it shows a surface marked with bands. Either because of its greater distance from Earth or because of the make-up of the bands themselves, they are less distinct than Jupiter's.

Saturn is the most distant planet we can see with the naked eye. Its rings were undetected before Galileo. Through his pioneer telescope Saturn appeared to have two blobs on its sides. Later astronomers, with better instruments, saw the "blobs" as a faint system of rings. Today, with a telescope moderate in power, we can see the rings distinctly.

They make Saturn unique among the planets of the solar system. They are divided into three—the outer ring, a middle (and brightest) ring, and a dim inner ring. They are all on one plane—like a sheet of cardboard cut into a doughnut shape with Saturn in the "hole."

Astronomers refer to the rings as the thinnest things in the solar system—since they are only 10 miles in thickness compared to their 171,000-mile diameter. If Saturn were reduced to the width of this page, the ring system would be a little more than twice as wide but only one-fourth as thick as the paper.

What are the rings made of? Astronomers agree that they are not solid circles spinning around Saturn. They are, instead, multitudes of tiny bodies orbiting around the planet—perhaps bits of rock, most likely fragments of ice. The theory is that these particles are the wreckage of one or more moons, shattered by the gravitational pull of the huge planet.

Five of Saturn's nine known satellites are in the same plane with the rings.

The largest of these moons—and the second largest in the solar system—Titan is approximately 700 miles greater in diameter than Earth's moon. It is the only satellite known to possess an atmosphere. This gaseous envelope is composed of methane—poisonous to man, but a gas we could presumably make into rocket fuel. So any exploration of the ringed planet would probably begin on Titan.

It is doubtful if we could ever land on Saturn itself. For one thing, it has about seven-tenths the density of water, and is probably chiefly gases. For another, it is extremely cold, and its ammonia-methane atmosphere is poisonous. F.S.

Over the years, water and silt have

226

buried Spina, Etruria's great port on the eastern coast of Italy. But once it ruled supreme on an ancient mouth of the Po.

Sailing ships crowded its harbor as the products of the Etruscan metal industry were sent to Venetia, Umbria, Phoenicia, Greece, and Asia Minor. Cargoes of Attic pottery, rare wood from Egypt, rich Phoenician textiles, and oil from Palestine were imported.

The conquering Romans were scandalized at the high-living Etruscans. They disapproved of unrestrained dancing and music, sumptuous feasting, games—the very things they themselves were later to become identified with. They would have looked askance at the domestic scene on the tomb below, the husband and wife equal in death as they had been in life. Both Romans and Greeks segregated their women in the home.

The Romans adopted the Etruscan arch in their architecture. They copied temples and used many Etruscan religious rites and symbols.

We know little about the Etruscans. We don't know where they came from. Were they immigrants from Asia Minor, perhaps from the west coast of what is now Turkey? Did they cross the Alps from present-day Austria? Or were they a native Italic people?

Their literature has disappeared, and the brief inscriptions on their tombs elude translators. Their language is not understood, although individual words and an Etruscan alphabet, related to Greek, are known.

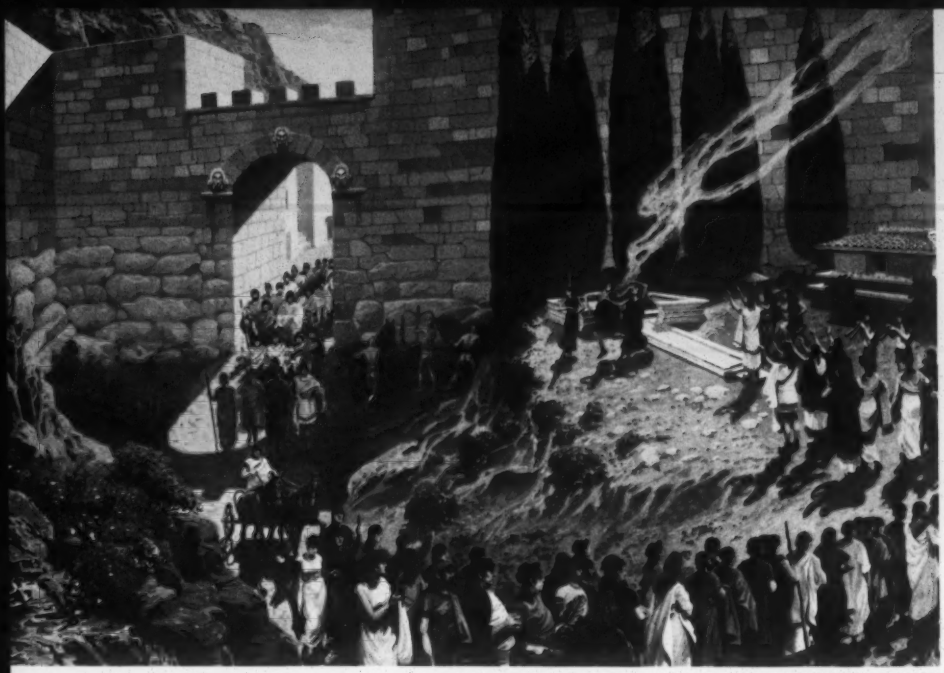
Most of what we do know has come from excavated tombs. Writing in the September, 1959, *National Geographic,* Carlo M. Lerici, in his article "Periscope on the Etruscan Past," describes a revolutionary new technique in archeology: the use of modern geophysical methods designed for the search for ores, water, or oil.

Aerial photography locates buried cities and ruins undetected on the ground. Electric currents pushed through the soil pinpoint treasures. Cameras are then sunk on the ends of tubes into the buried ruin. Thus archeologists determine if a tomb is worth excavating. L.B.

227

W. ROBERT MOORE, NATIONAL GEOGRAPHIC STAFF

UMI



PAINTING BY H. M. HERGET

Scholars Re-create Etruscan Era

GHOSTS CLOAKED in mystery haunt the Italian countryside: ghosts like the emotion-fired dancers, above, marching to flutes outside the walls of Rome.

Etruscans they are called. They lived in luxury and power between the 8th and 4th centuries B. C. Their loose confederation of city-states ruled Italy from south of Pompeii to the valley of the Po River. Their prosperous civilization flourished, then all but vanished when the Romans overwhelmed them between the 4th century and the beginning of the Christian era. Modern specialists are uncovering their relics.

Where now only the gullies of streams thick with scrub scar the hills of Italy, wealthy cities once thrived: cities where men and women in vividly colored clothing reclined on elegantly embroidered couches and stretched their hands toward tables laden with food. Huge candelabra lit the feast and reflected the rich and sparkling jewelry of the diners. Musicians, their heads bent to the flute, lyre, or zither, accompanied dancers weaving between the couches.

Etruscans cheered at chariot races and foot races. They enjoyed wrestling matches and boxing bouts.

Their mighty fleets swept over the Tyrrhenian Sea for centuries, subduing Greeks and Carthaginians. They sold the riches dug from their mines to the Greeks, and their artists borrowed from Greek works.

Over the years, water and silt have

To the Etruscans death was a continuation of life with all its pleasures. Sports, dancing, music, and banquets occupied their lives; the same would fill the afterworld. For graves, they built rock copies of their homes, crowded them with rich furnishings, and decorated the walls. Two wrestlers, above, adorn a tomb. Another portion of the scene shows an umpire, below left, with part of his retinue. A woman's tomb probably held the fine pottery and mirror, below right.

PHOTOGRAPHS BY W. ROBERT MOORE, NATIONAL GEOGRAPHIC STAFF.

UMI